IMPASS / VAST BRIEF

Integrated Maritime Portable Acoustic Scoring & Simulation (IMPASS) System

How we do business…

- The IMPASS System and Team IMPASS provides surface ships the means to perform a FIREX I event, to qualify in Naval Gunfire Support (NGFS)
- This provides:
  - Flexing of the platforms NGFS Team with live spotters and live Call For Fire
  - Flexing of platforms Gun Weapons System. From the Mag Crew through the round down range

How we do business…

- **Three IMPASS Systems and two IMPASS Teams at EWGTLANT.**

  *****Delivery scheduled for ten more systems in December 2004.**

- **Ships must satisfactorily complete a 1-week NGFS COI prior to shooting FIREX I.**

- **Upon completion of NGFS COI, ships have 90 days to conduct FIREX I.**

- **IMPASS buoys are delivered to ship prior to FIREX.**

System Efficiencies…

- **Sea-Borne**
  - **Minimizes the need for a permanent land-based range for Naval Gunfire Support Qualification.**
  - **Answers diminishing land range availability.**
- **Allows system operators to accurately access Initial Salvo Error (ISE).**
- **Capable of integrating with other synthetic systems to include Virtual At Sea Trainer (VAST) and Battle Force Tactical Trainer (BFTT).**

Limitations

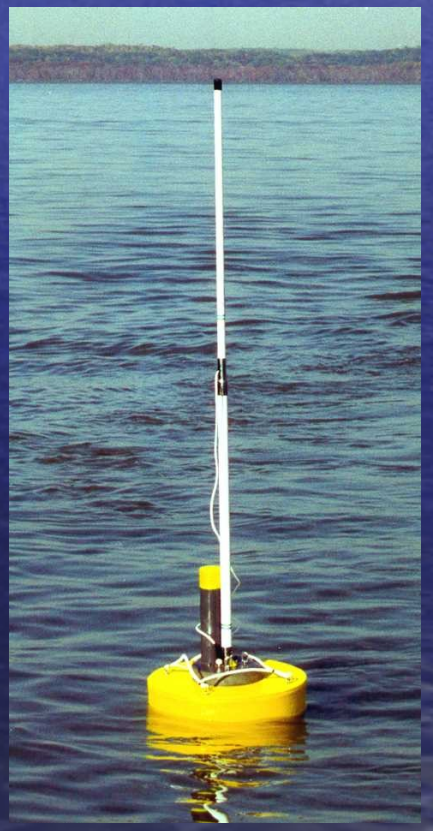
- **Sea State of 3 or less. Buoy recovery during a high sea state may compromise Boat Crew safety.**
- **IMPASS System unable to score Illumination rounds or Height of Burst.**
- **Loss of buoy GPS lock causes a delay in the exercise, a return to last known buoy position, buoy retrieval and re-seeding .**
- **Marine Life mitigation.**

Qualifications to date

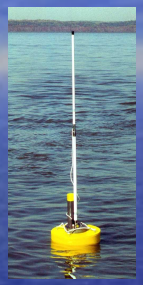
- 21 Atlantic fleet ships have qualified on the IMPASS virtual range.
  - 17 ships have conducted FIREX I (11 missions) with an average score of 91.42%.
  - 4 ships have conducted FIREX II (6 missions) with an average score of 91.93%.

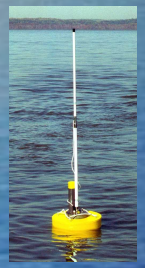
Assembly...

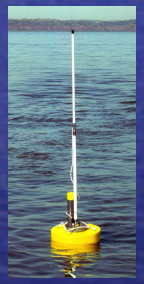
Supervised by IMPASS Team



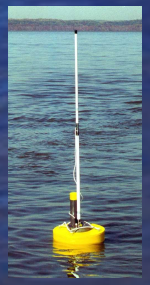
Minimum of 800 meter spacing between buoys

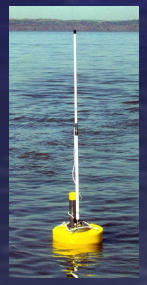






IMPACT AREA





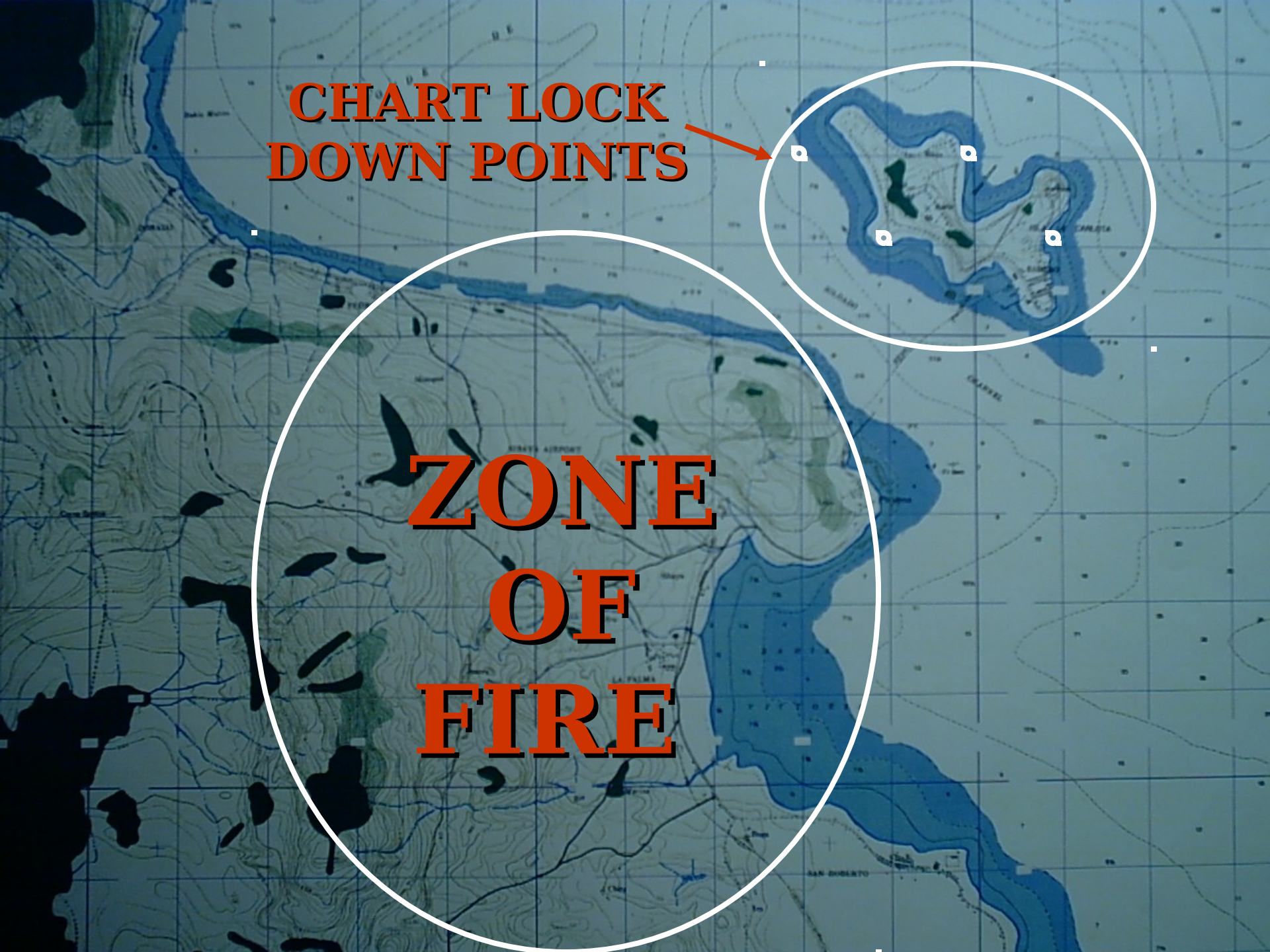
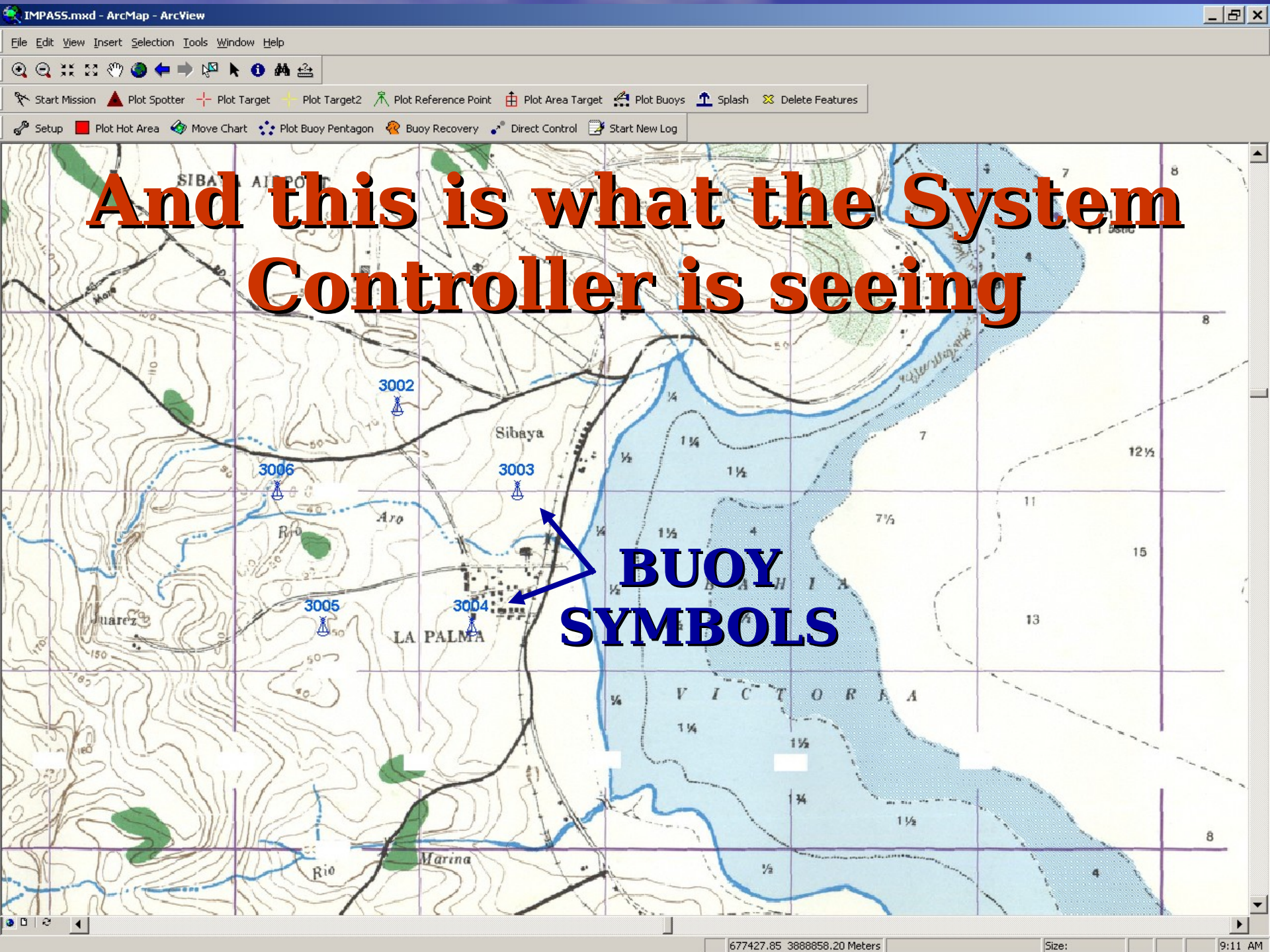


CHART LOCK
DOWN POINTS
ZONE
OF
FIRE

64

This is what the ship is seeing...


IMPASS.mxd - ArcMap - ArcView
File Edit View Insert Selection Tools Window Help
Start Mission
Plot Spotter
Plot Target
Plot Target2
Plot Reference Point
Plot Area Target
Plot Buoys
Splash
Delete Features
Setup
Plot Hot Area
Move Chart
Plot Buoy Pentagon
Buoy Recovery
Direct Control
Start New Log
And this is what the System Controller is seeing
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3006
3003
3005
3004
Sibaya
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Size:
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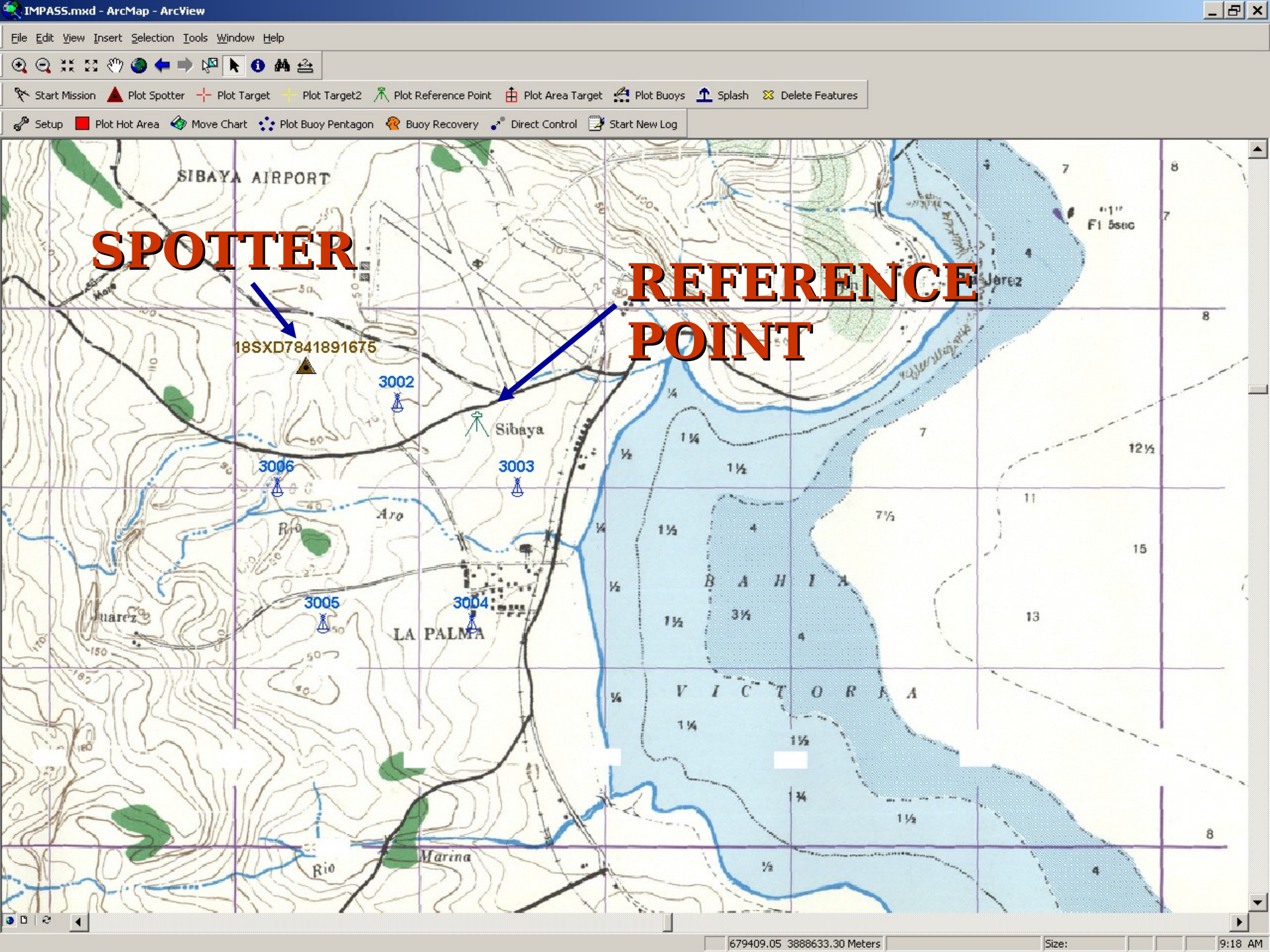
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Start New Log
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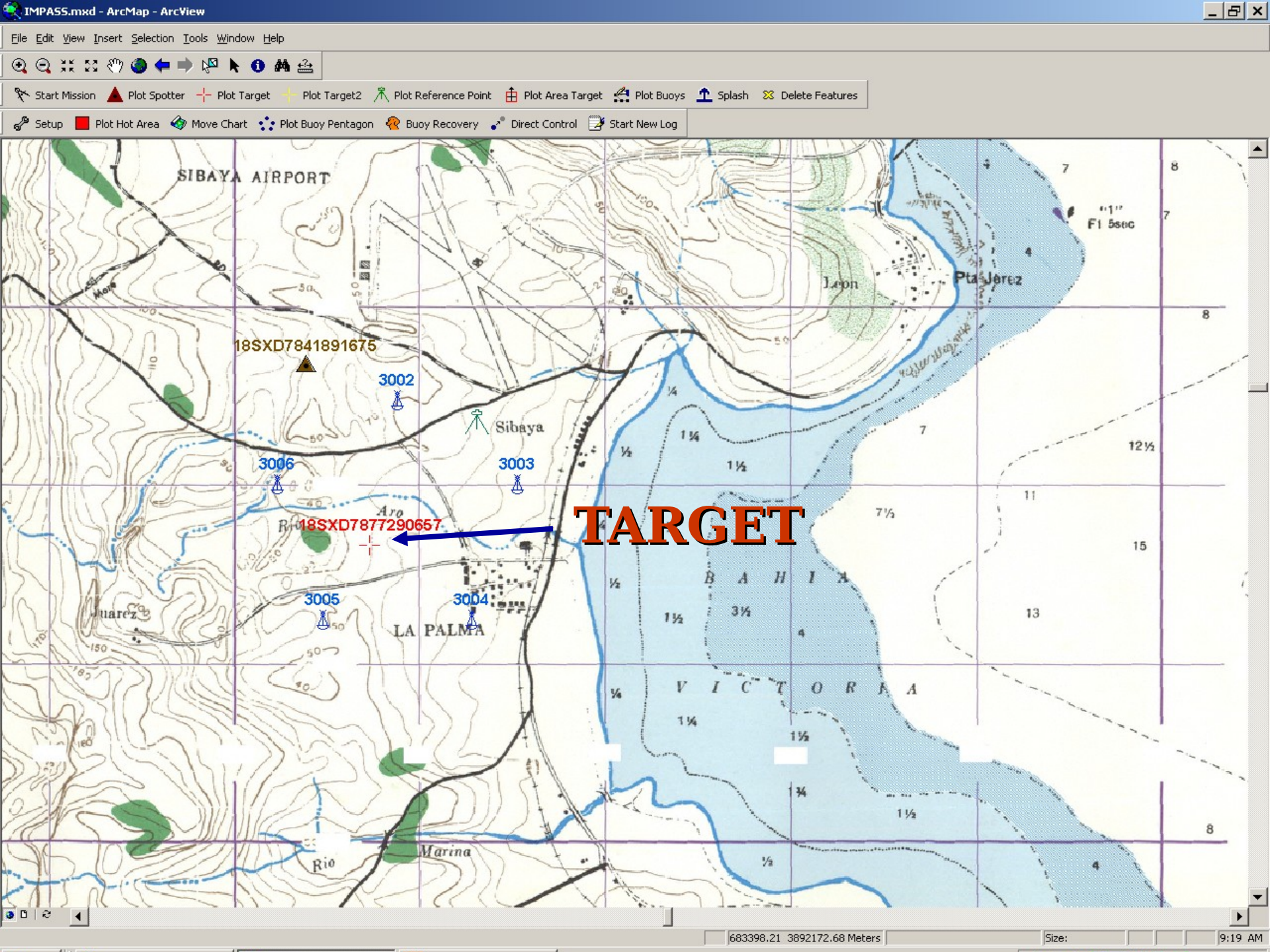
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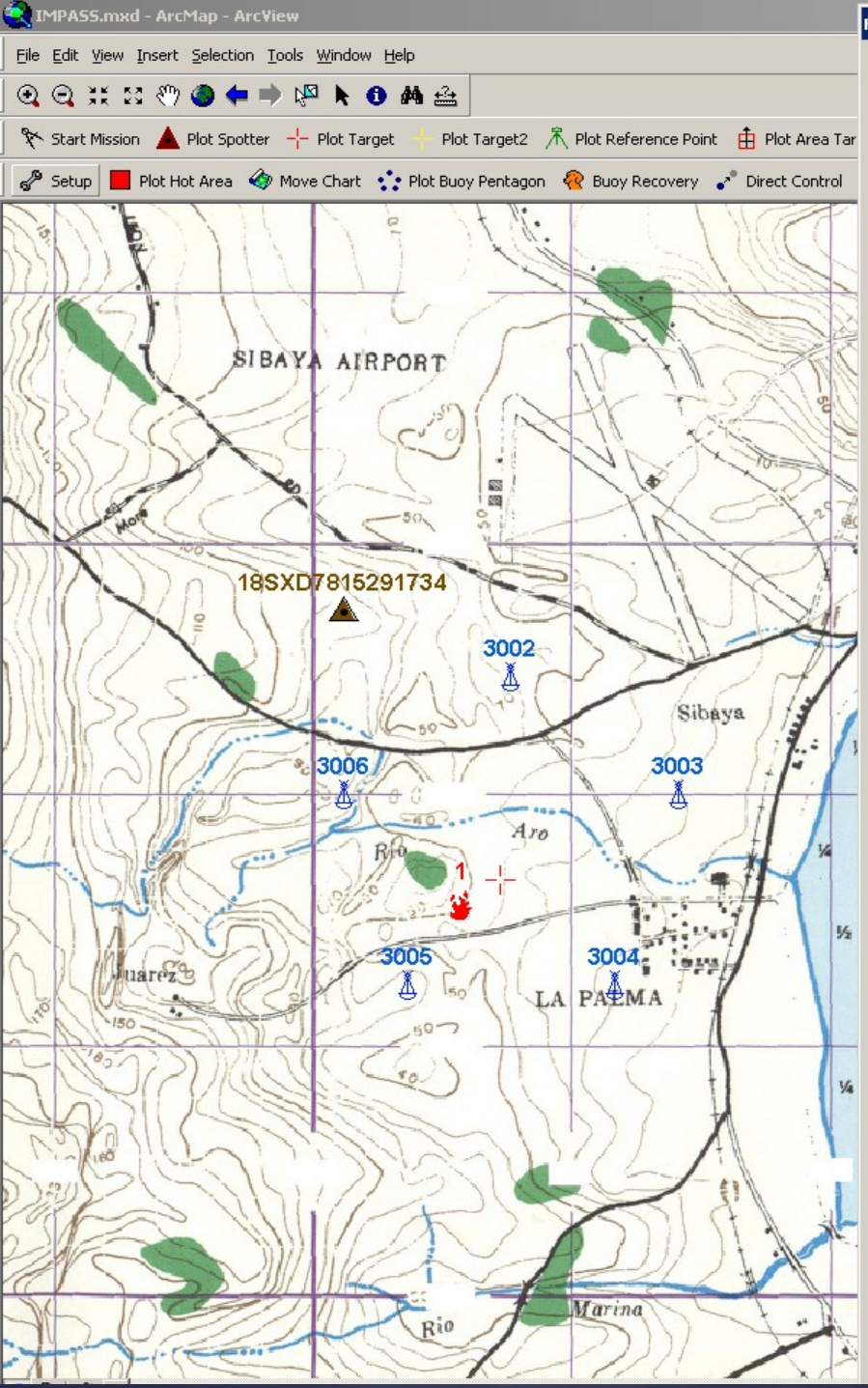

Fire Mission - Basic Call for Fire - Grid

Triggers

- T: 3001 11456.0000 18SXD6000036181
- T: 3002 11466.6913 18SXD7888991552
- T: 3003 11466.7107 18SXD7953791082
- T: 3004 11466.4782 18SXD7929090321
- T: 3005 11466.1747 18SXD7849090321
- T: 3006 11466.4296 18SXD7824391082

Solutions

- Sol: 18SXD7861190553 11466.000 0
- Adj-1: Left 186 Drop 9
- ISE-1: 186

Mission Type: Basic Call for Fire - GRID [Help]

Grid: Spotter 18SXD7815291734 Width 10 [Plot]; Reference (no reference) 10 [Plot]

Direction

Target 1: Manual / GTL — MILS GRID — 2667 [Set]

Target 2: Manual / GTL — MILS GRID — 0000 [Set]

Grid Targets

	Grid	Width		
Target 1	18SXD7876790654	10	Plot	Load
Target 2	(no target2)	10	Plot	Load

Polar Targets

	Distance (m)	
Target 1	1243	Plot
Target 2	(enter)	Plot

Shift Targets (from Reference Point)

	Left/Right		Add/Drop		
Target 1	Left / Right	(no ref)	Add / Drop	(no ref)	Plot
Target 2	Left / Right	(no ref)	Add / Drop	(no ref)	Plot

Geodetic Targets

Target 1 35ø 8.5746' N, 73ø 2.2593' W

Target 2 (no target2)

Danger Close First Salvo At (from Target 1)

	Direction	Distance	
Target 2	0000	(enter)	Plot

Area Target

Grid Center	Attitude			
(no area target)	0	Plot	Save	Load

Fresh Target (from last impact)

	Left/Right		Add/Drop		
Target 2	Left / Right	(enter)	Add / Drop	(enter)	Plot

QUESTIONS

EXPEDITIONARY WARFARE TRAINING GROUP
ATLANTIC
EWTGLANT
Expeditionary Warfare Training Group, Atlantic
LCAC-86

VIRTUAL AT SEA TRAINER (VAST)

“VAST” DESIGN CONCEPT

“Integrate existing technologies and programs into a complete system designed to meet the training and qualification requirements of the fleet for Naval Surface Fires Support (NSFS) and to provide sufficient realism compared to actual land firing ranges such that the Navy can

CONCEPT FOR VAST AT SEA (Live Fire)

- Simulate existing naval firing ranges with “at sea” ships location
- Virtual representation of the firing range is “moved” from real world co-ordinates to the ship’s current position
- 2D surface impact point (using IMPASS) is transmitted back to VAST System located on ship

CONCEPT FOR VAST AT SEA (Live Fire)

- The 2D splash point is translated to a 3D detonation based on the:
  - Gun Angle (bearing and elevation)
  - Ship's position at the time the gun was fired
  - Terrain data base of the virtual firing range
- Spotter monitors computer display to determine adjustment just as FO would at land range

CONCEPT FOR VAST IN-PORT (Constructive Fire)

- Allow ship to train without leaving port or expending rounds
- Gun remains stowed / secured
- Virtual range coordinates injected into ship's NAV equipment
- System simulates ownship Position, Heading and Speed

CONCEPT FOR VAST IN-PORT (Constructive Fire)

- Gun Weapon Simulator monitors gun and load orders
- Simulated ballistic flyout of rounds
- Present correction (adjustments) to ship's Gun Plot Team
- Spotter monitors computer display to determine adjustment just as FO would at land range

CONCEPT FOR VAST Forward Observer

- 2 Laptop computers for FO and FDC
- Translates 2D splash point (actual coordinates) to 3D detonation point in virtual range
- Presents visual image of round detonation on range at a remote location
- Compares 3D detonation to Target of Intent
- Compares corrections based on Observer Target Line (OTL)

QUESTIONS

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